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# THE PLANT DISEASE BULLETIN

Issued by

## THE PLANT DISEASE SURVEY

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THE PLANT DISEASE BULLETIN

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THE PLANT DISEASE SURVEY

Vol. IV Number 5

Diseases of corn, flax, potato, bean, cotton, tobacco, and apple are reported in this issue

The summaries on diseases of flax and tobacco are of especial interest as they contain reports from crop specialists from the Cereal and Tobacco Offices of the Bureau of Plant Industry.

Tobacco leaf spot diseases seem to be particularly prevalent this season.

Physoderma on corn has been found in new sections of Indiana and Nebraska this season. The occurrences in both states have extended the known geographical range as they are somewhat beyond the previous outer limits.

Potato late blight is progressing in the northeast. (See reports and map; pages 72-74.)

## CEREALS

### CORN

#### Smut caused by Ustilago zeae

Corn smut has been reported on sweet corn in Massachusetts, New Jersey, Virginia, Georgia, Ohio, Minnesota, Louisiana, and Mississippi. In most cases it is present in about the usual amounts or less, and is causing only slight damage. In New Jersey, however, it is said to be the cause of many complaints; and Ohio reports more than the normal amount, although rarely injurious. This is said to be due probably to almost continuous wet weather. In South Dakota and Southeastern Wyoming the disease is occurring, in most cases slightly, according to reports from Arthur T. Evans and H. G. MacMillan, respectively.

South Dakota: Huron, Beadle County, 40 acre field. Ears, tassels, leaves, and stalks infected. Many ears completely smutted. Reduction in yield 10%. Funks 90 day. (Evans, Sept. 13)

### Wilt caused by Aplanobacter stewartii

Virginia, Ohio, and Tennessee are the only states reporting the presence of bacterial wilt as yet. In Virginia it is said to be common on sweet corn in gardens, especially on the variety Golden Bantam, while in Ohio it is apparently unimportant. In Tennessee it is causing considerable damage on field corn in some fields, according to C. Kurtzweil (Cereal Courier 12: 201, July 10).

### Brown spot caused by Physoderma zeae-maydis

Reports of Physoderma have been received from two states on the northern border of the area where it is known to occur. In Indiana it was found at Shelbyville, July 28, by J. S. Trost. Prior to this year it had never been reported to the Survey from Shelly County. The Nebraska report is also from a new locality, and indicates that the disease is causing more damage than would ordinarily be expected in this state, in the vicinity of Lincoln. It is possible that unusual occurrences of this disease may have been caused by the exceptionally wet weather of this season.

Indiana: J. S. Trost discovered Physoderma on corn at Shelbyville, Indiana, July 28, and reported it to G. N. Hoffer. (A. G. Johnson, Aug. 6)

Nebraska: The Physoderma disease of corn is found especially prevalent this year around Lincoln, owing to the heavy rainfall this month. The damage is considerable, as the disease has caused the breaking over of the stalks in many cases. (R. W. Goss, Sept. 1)

## FLAX

The greater part of the information on flax diseases of this year summarized below, was obtained from the report of W. E. Brentzel, of the Office of Cereal Investigations, who made an inspection tour through parts of Minnesota, North Dakota and Montana looking for flax diseases. He visited the following places:

Minnesota - Dilworth
North Dakota - Fargo, Buchanan, Jamestown, Pingree, Windsor, Alfred, Hensler, Sharon, Mandan, Dickinson, Ambrose and Williston.
Montana - Moccasin, Havre, Plentywood and Midby

### Wilt caused by Fusarium lini

Wilt is apparently general in the flax-growing sections of North Dakota and Minnesota and also occurs in the northeastern part of Montana according to observations of W. E. Brentzel on his recent flax disease inspection trip. Wilt was found by Mr. Brentzel at all places visited (listed above) except

Sharon, North Dakota, and Moccasin and Havre, Montana. He summarizes his findings as follows (Cereal Courier 12:276, Aug. 20):

> "Flax wilt was found as far west as Dickinson, N. D., Williston, N. D., and Plentywood, Mont. At Plentywood infection in one field was 10%. At Dickinson infection was very slight and farther west at Moccasin and Havre, Mont., no wilt was found in any of the fields visited. There was no wilt at Moccasin where land had been sown to flax continuously for the last five years."

The variety NDR 114 continues to show resistance to wilt, according to A. G. Johnson (July 27).

Michigan: A trace of wilt was found in the fiber flax plots of Mr. R. L. Davis. Less than 1% wilt was found at Crosswell, Michigan, at this time.

On a later trip to Michigan, July 24-26, a number of fields of fiber flax at Yale were free from disease. One field noted in one corner of which 50% of the plants were wilted; another showed 20-50% wilt at various places; one other field at Yale showed 1% wilt. A field at Peck showed as high as 7% wilt in some spots, but probably averaged less than 1%. A trace of wilt was found at Crosswell. A number of fields around Applegate showed about 1% wilt. (Chas. S. Reddy, Aug. 5)

Minnesota: General all over the flax growing section of the state. Varying in severity from a trace to 90% loss, averaging, perhaps, around 12 or 14%. First report May 23. (Leach., Sept. 1)

## Rust caused by Melampsora lini

No rust was found in Montana or in western North Dakota during Mr. Brentzel's survey for flax diseases. It has been reported from Minnesota and Eastern North Dakota, however.

The following report from Mr. Brentzel gives a summary of the findings of rust (Cereal Courier 12:276, Aug. 20):

> "Flax rust was noted as to occurrence and severity. No rust was found west of Dickinson, North Dakota. All fields visited in Western North Dakota and Montana were free from rust. Infection was severe in eastern North Dakota, running as high as 100% in some fields examined. All fields visited in the Red River Valley were infected to a greater or less degree depending considerably upon the variety of flax grown."

Minnesota: Not very prevalent. Reported from Red River Valley. (Sept. 1, Leach)
North Dakota: Flax rust appeared June 7. Some varieties are more severely attacked than others though none is suffering much injury as yet. (Brentzel, Cereal Courier 12: 207, July 10)

## Canker (non-parasitic)

Data from Mr. Brentzel's report indicate that canker is generally distributed in Western Minnesota, North Dakota and Montana, though much more severe

in the last named state. The disease was also reported as causing very slight damage in Hyde County, South Dakota, by A. T. Evans (Aug. 13).

Investigations conducted at the State Experiment Station at Fargo, North Dakota, show that "excessive heating of the surface soil by the hot sun will injure the plants at the soil line and cause canker." (W. E. Brentzel, Cereal Courier 12: 207, July 10).

The following is a summary of conditions in Minnesota, North Dakota and Montana by W. E. Brentzel (Cereal Courier 12: 276. Aug. 20):

> "Flax canker, while apparently very much more severe in Montana, was found at all points visited, the damage in commercial fields in eastern North Dakota being slight, while at Dickinson and Williston, North Dakota, and Plentywood, Montana, the damage ran from moderate at Dickinson, more severe at Williston, and as much as 10% or more at Plentywood. Farther west at Moccasin and vicinity the damage was about 25% and at Havre as high as 50% or more in one large commercial field examined."

### Anthracnose caused by Colletotrichum lini

The occurrence of anthracnose on fiber flax in Michigan was reported by C. S. Reddy as follows (Aug. 5):

> "On June 16 at East Lansing anthracnose was noted ranging from less than 1% in some plots to more than 60% in others. In many cases the anthracnose was producing a type of canker. In two fields belonging to the American Company at Yale, Michigan, less than 1% anthracnose was noted. Five percent was found in one field near Peck."

## VEGETABLES AND FIELD CROPS

### POTATO

#### Late blight caused by Phytophthora infestans

Since the last report in the Plant Disease Bulletin of the occurrence of late blight, the disease has progressed markedly on the late crop in the states from which it has been reported and has been noted in several localities in Ohio. It now appears that the disease is general on the foliage in Aroostock County, Maine, the greater part of Vermont, Western Massachusetts, New York, New Jersey (on the eastern side especially), Pennsylvania and parts of Maryland and West Virginia.

The accompanying map shows counties where blight has actually been located and

Fig. 2. Occurrence of potato late blight, 1920. Each dot represents a county.

reported to the Survey, but of course the disease is much more widespread within the area than the map would indicate.

Vermont: Mr. Gilbert reports a general outbreak after Aug. 15, which includes practically all the state except regions in the Champlain Valley. (Lutman, Aug. 15)

Massachusetts: First reported Aug. 9. Very severe in the western part of the state. (Krout, Sept. 1)

New York: Reported first up-state in Monroe County Aug. 2. Since then it has been observed in Oswego, Seneca, Otsego, Allegany, Chautauqua, Tompkins, Genesee, Steuben and Tioga Counties. In some fields the vines are nearly all dead, although few reports have been received of rotting tubers. (Chupp, Aug. 1)

New Jersey: Appeared early in July and widely distributed throughout the state. Very severe and the cause of heavy losses in Monmouth County, but gradually dimishing westward. The losses in Mercer and Middlesex were slight. Practically no loss in other parts of the state. (Cook, Sept. 1)

While at Redbank, New Jersey, on Aug. 17, I found the digging of potatoes practically suspended on account of the prolonged wet weather. In some fields, where digging was under way, farmers were discarding many potatoes, owing to the fact that soft rot has followed late blight injury. The wet type of Fusarium rot is also much in evidence. Late blight is apparently widely distributed in the state this year. Mr. Ellwood Douglass, county agent of Monmouth County, reports 20-65% late blight dry rot in fields where the foliage was severely affected. The farmers are taking great pains to cull out all stock that shows initial stages of attack. (F. C. Meier, Aug. 26)

Pennsylvania: Rain has caused considerable blight and rot, particularly on ground. (Weekly Crop Notes*, Sept. 2)

Potato blight increasing and considerable rot reported from southeastern counties. (Nat. Weather and Crop Bul., Sept. 1)

Epidemic throughout the state. Reported even from Adams County, which is quite unusual. All but best sprayed fields are dying or dead. Tubers rotting. Loss promises to be heavy. (Thurston, Sept. 1)

Delaware: Good crop of Irish potatoes expected. Some slight blight reported where rains have been excessive and there are some complaints of rotting. (Weekly Crop Notes*, Sept. 2)

Maryland: Too much rain for Irish potatoes; blight and rot is reported in some sections but crop is still promising. (Weekly Crop Notes*, Sept. 2)

West Virginia: Occasional blight reported but condition excellent as a whole. (Weekly Crop Notes*, Aug. 19)

Ohio: Miss Detmers made the first collection for the season of potato late blight, Phytophthora infestans, in the Station plots at Wooster, Aug. 23, 1920. Subsequently numerous collections were made in surrounding district. Considering the character of the season the appearance of late blight is later than anticipated. In 1915 the first collection was made Aug. 9, while in 1917 it was found July 24. (Selby, Sept. 1)

Its presence was discovered Aug. 23 on the Station farm and in Wooster gardens. Later specimens have been received from Muskingum County. We apprehend that it is widespread and may severely affect the late potato

*U. S. Dept. Agr. Bur. Crop Estimates, Weekly Crop Notes, 1920.

crop, as the cool, wet weather is favorable to its dissemination. (Miss Detmers, Sept. 1)

### Early blight caused by Macrosporium solani

The following reports further indicate sub-normal amounts of early blight:

Massachusetts: Prevalent but causing no serious loss. (Krout, Sept. 1)
Pennsylvania: Reported as damaging in southern counties. (Thurston, Sept. 1)
New Jersey: Widely distributed throughout the state but less severe than usual. (Cook, Sept. 1)
Ohio: In many localities none has appeared, and wherever it has been found it was a very light attack. (Miss Detmers, Sept. 1)
Minnesota: Generally distributed over the state. Light to moderate infection. Earliest report July 7. (Leach, Sept. 1)
Nebraska: Early blight present in varying amounts throughout the state. Damage of no practical importance. (Goss, Sept. 1)
Wyoming: Maturing varieties as Triumph and Ohio badly attacked. Plants too mature to cause much damage. Trace on Kings and Cobblers. (MacMillan, August)
Oregon: Some along the coast but damage slight. (Barss, Sept. 1)
In few fields unfavorably situated, that is, with too much soil moisture. Damage slight. Multnomah County. (McKay, Sept. 1)

### Fusarium wilt caused by Fusarium oxysporum

Fusarium wilt is reported very prevalent on late potatoes in Indiana where it is by all means the worst fungous disease of the crop. In the Red River Valley of Minnesota, Mr. Shapovalov, of the Office of Cotton, Truck and Forage Crop Disease Investigations, found wilt to be common and in many cases associated and complicated with black leg.

In Nebraska the disease is found in varying amounts in practically all fields. Colorado is not experiencing the losses this year from Fusarium wilt as is often the case.

### Leaf roll (cause undetermined)

Leaf roll is prevalent in certain northeastern states as shown by the following reports. (See also Pennsylvania report, Pl. Dis. Bul. 4: 56, 1920)

Massachusetts: Present in small amounts in most of the fields examined. (Krout, Sept. 1)
New York: Leaf roll was reported first, June 28 from Albany, Orleans and Steuben Counties. It is found in nearly every field where potatoes are grown, especially on the "Rural" type. Great effort has been made by many growers in obtaining disease-free stock, either by purchasing seed which had been inspected, or by means of separate seed plots, and elimination of the diseased hills as soon as they appear. There are a few "Rural" strains that are almost free from leaf roll. (Chupp, Aug. 1)
New Jersey: Very common on Cobblers. Much more abundant than usual. Symptoms

very prominent in early part of the season but much less prominent later. (Cook, Sept. 1)

Minnesota: Not very prevalent; of little importance. (Leach, Sept. 1)

Nebraska: Leaf roll plants in a few fields in the western part of the state. (Goss, Sept. 1)

### Mosaic (cause unknown)

Pennsylvania: Reported locally from Centre and Luzerne Counties. Known to be quite general throughout the state, though definite reports for this season are not at hand. (Thurston, Aug. 1)

New Jersey: Variable, depending on source of seed. (Cook, Sept. 1)

Georgia: Observed on 90% of the Red Bliss planted as a spring crop. Also observed on Green Mountains. Cobblers, Early Ohios and Early Rose were free from mosaic in the spring crop. (McClintock, Aug. 1)

Minnesota: Northwestern Minnesota seems to have the same problems as Northern Wisconsin, mosaic being their main problem. I saw also one excellent field of Green Mountains showing less than 1% of distinct mosaic. At Bemidji mosaic was also present. (M. Shapovalov, News Notes of the Office of Cotton, Truck and Forage Crop Disease Investigations, Aug. 28)

Mosaic very prevalent. Extremely destructive on Triumphs. Green Mountain variety also rather heavily infected. (Leach, Sept. 1)

Nebraska: Mosaic present in practically all fields of Triumph potatoes. Both on the irrigated and dry land. Fields from carefully selected local seed are either free from the disease in most cases or only a trace of mosaic present. Fields planted with the ordinary commercial seed show a large percentage of infection. Other varieties of potatoes show much smaller amount of mosaic. (Goss, Sept. 1)

Nevada: The disease is found in various parts of the state, but the loss is very slight. (Lantz, Aug. 1)

Oregon: Occurs widely in many fields. Generally not more than 2%. Damage slight. (McKay, Sept. 1)

### Other diseases

Rhizoctonia is reported by McKay from Oregon, Sept. 1, as being widespread in the western part, causing in combination with the hot, dry weather of August, the premature death of 10-30% of the plants. Very bad where rotation is not properly used.

Wilt, caused by Verticillium albo-atrum is reported by McKay, Sept. 1, as being present in western Oregon in about the usual amounts where ordinary seed potatoes or improper rotations are used.

## BEAN

### Blight caused by Bacterium phaseoli

Reports from New York, Indiana and Minnesota show that bacterial blight is as destructive in those states, as in others from which reports have been received previously.

New York: The most common of the bean diseases at present. Found in practically every dry and snap-bean field. No resistant varieties have yet been developed. First reported in Albany County, July 6. (Chupp, Aug. 15)
Indiana: Extremely destructive. (Gardner, Aug. 15)
Michigan: Blight seems to be the prevalent disease of beans in Michigan this year. On account of the blight, bean production may be below normal. Three weeks ago the crop was reported to be above normal, but the blight has cut this estimate down considerably. (O. F. Burger in News Notes of the Office of Cotton, Truck and Forage Crop Disease Investigations, Aug. 28)
Minnesota: Abundant during July and August. Generally present in varying amounts. Only a trace in some fields, others showing as high as 80% infection at an estimated loss of 25%. (Leach, Sept. 1)

Anthracnose caused by Colletotrichum lindemuthianum

In New York and Pennsylvania anthracnose is apparently causing somewhat more loss than in most of the states previously reporting the disease.

New York: Common and very destructive in some snap-bean fields. Most of the dry bean growers have either changed to other crops, or are growing strains which have proved resistant to one or both strains of the fungus. Well's Red Kidney is one of these resistant strains.
Pennsylvania: Losses of 5-25% reported. (Thurston, Aug. 15)
Minnesota: Very abundant during early July. Some fields suffering 5-10% loss. Rather scarce during later July and August, due to extreme drought. First report July 4. (Leach, Sept. 1)

Rust caused by Uromyces appendiculatus

Additional reports of the occurrence of rust have been received from New York, Pennsylvania and Minnesota. In no case was it said to be causing appreciable damage.

Mosaic (cause undetermined)

New York: A large number of growers who have had serious losses due to mosaic have either quit growing beans or are planting the "Michigan Robust strain". Other varieties are being bred for mosaic resistance. (Chupp, Aug. 15)
Pennsylvania: Reported as common in Luzerne and Northampton Counties. (Thurston, Aug. 15)
Georgia: Less than 1% on string or snap beans. (McClintock, Aug. 15)
Indiana: Not serious. (Gardner, Aug. 15)
Michigan: The mosaic is doing a great deal of damage, although the blight seems to be the problem this year. (Burger, News Notes of the Office of Cotton, Truck and Forage Crop Disease Investigations.
Minnesota: Mosaic abundant, varying in severity. Some

varieties showed as high as 10% loss. Others showed higher percentage of infection with mild form, causing but slight injury. First report June 1. (Leach, Sept. 1).

Oregon: General and widely distributed. In many fields a very high percentage of diseased plants, often close to 90 or 100 percent. Fields showing no trace of mosaic are rare. (Barss, Sept. 1).

### Mildew caused by Phytophthora phaseoli

Mildew is reported as serious on lima beans in Greene, Philadelphia and Delaware Counties, Pennsylvania. (Thurston, Aug. 15).

## COTTON

### Fusarium wilt caused by Fusarium vasinfectum

Wilt is causing serious damage again this year on many sandy soils in the South, where non-resistant varieties are planted. In addition to the following states, Oklahoma has experienced losses from the disease, but apparently not of a serious nature.

Georgia: None observed to date. Largely controlled in this state through the planting of wilt resistant varieties. (McClintock, Sept. 1).

Alabama: Wilt is very bad in Alabama this year. From one-fourth to one-half of the plants in the fields in some counties are affected. (Thiel, Sept. 1).

Mississippi: Present in many parts of the state, especially in the sandy loam soils, where wilt resistant varieties are not planted. Loss serious in many parts of the state. (Neal, Sept. 1).

Louisiana: Heavy infection in some parts of the state. (Edgerton, Sept. 1).

Arkansas: Scattered over a large part of the state. Severe in some places. (Elliott, Sept. 1).

### Root knot caused by Heterodera radicicola.

Georgia: Serious where cotton is planted on heavily infested soil. One hundred per cent infestation in such soil. (McClintock, Sept. 1).

Mississippi: Very little root knot has been observed this season. It was found in one field near Agricultural College, Mississippi. (Neal, Sept. 1).

Louisiana: Of minor importance in this state. (Edgerton, Sept. 1).

Arkansas: Bad in some sandy lands. Probably causes more damage than is commonly known. (Elliott, Sept. 1).

### Anthracnose caused by Colletotrichum gossypii

Georgia: Very small percentage observed on the cotton seen in middle Georgia, probably due to dry weather early in the season. (McClintock, Sept. 1).

Alabama: Present in the state. No data on damage. (Thiel, Sept. 1).
Mississippi: Reported from a few counties in the Delta. Apparently of little importance this season. (Neal, Sept. 1).
Louisiana: Infection rather heavy this year. This is due to the very heavy rainfall of the past six weeks. (Edgerton, Sept. 1).
Oklahoma: There are reports of cotton anthracnose and shedding of lower leaves. (Weekly Crop Notes, Aug. 26, 1920:4).
Arkansas: Severe in some places but not generally distributed. (Elliott, Sept. 1).

Angular leaf spot and boll rot caused by Bacterium malvacearum

General in Alabama, Mississippi, Louisiana, Texas and Arkansas and local in Oklahoma. In Arkansas it is reported as the most serious disease in the state. In Louisiana it has been less serious this year than in former years. A considerable amount of boll rot was reported from Texas, due to the excessive moisture, low temperature and lack of sunshine. There were scattered instances in Oklahoma due to the same weather factors as in Texas.

Alabama: Quite general throughout the state. Inquiries received from various sources indicate that the disease is quite common. (Thiel, Sept. 1).
Mississippi: Present in many parts of the state, but never causes any serious injury. (Neal, Sept. 1).
Louisiana: Present in all sections, but apparently not doing as much damage as in some other years. (Edgerton, Sept. 1).
Oklahoma: There are a few reports of angular leaf spot in various sections, but no serious damage. (Weekly Crop Notes, Aug. 19).
Arkansas: Very severe in eastern part of the state in June. Many plants killed. (Elliott, July 1).
Common, widely spread and most serious disease of the state. Very severe on bottom lands early in the year. Becoming severe again now. (Elliott, Sept. 1).

Malnutrition (non-parasitic)

Malnutrition has played a considerable part in reducing the yield of cotton this year. Reports from Florida and South Carolina also indicate deterioration from "rust" as it is called by the growers.

Georgia: None observed or reported to date. Have not observed it since 1918, probably due to farmers using more potash in their fertilizer. (McClintock, Sept. 1).
Louisiana: Have received no complaints. This trouble is very seldom present to any serious extent except in dry seasons. (Edgerton, Sept. 1).
Mississippi: Potash hunger present in many parts of the state. In many fields defoliation was complete by the middle of August. Yields, however, do not appear to be materially reduced. This trouble seems to hasten maturity. (Neal, Sept. 1).
Arkansas: Common on some of the coarser sand lands and other poor soils. (Elliott, Sept. 1).

## Other Diseases

Fusarium rots of cotton caused by Fusarium sp. are becoming very serious in New Mexico. (Leonian, June 15)

Black boll, caused by Diplodia gossypina, is causing considerable loss this season in Louisiana, due to the heavy rainfall. (Edgerton, Sept. 1)

# TOBACCO

According to W. W. Garner, Office Tobacco Investigations, Bureau of Plant Industry, the outstanding feature in the tobacco disease situation this year has been the unusually large number of leaf spot diseases reported from the various commercial sections, doubtless because of the prevailing wet weather.

## Wild-fire caused by Bacterium tabacum

Wild-fire is reported this season from Massachusetts, Connecticut, Maryland, Virginia, Kentucky, and Tennessee. It is interesting to note that this is a new disease for Massachusetts.

Massachusetts: Observed this year in three localities in Massachusetts for first time. Reported to have occurred last year in at least one field. Damage as yet very slight. (G. H. Chapman, Sept. 1)

Connecticut: On my trip to the Connecticut Valley last week (Sept. 1st), several instances of the appearance of wild-fire in the tobacco seed beds in Hartford County were brought to my attention and in one case in the vicinity of Granby the disease persisted until the tobacco had been harvested. (Garner, Sept. 9)

Maryland: Wild-fire appeared in seed beds in Charles and Prince George Counties, and in some instances has caused serious damage to the crop in the fields in these counties. Also reported from Bristol, Ann Arundel County, August 31. (Garner, Sept. 9)

Kentucky: Present in 50% of the fields of Burley so far examined. Very destructive in some fields, especially in the smaller tobacco. A disease of dark tobacco resembling wild-fire is causing severe losses in the western tobacco sections. This is being studied to determine its relation to the Burley diseases. (Valleau, Sept. 1)

## Angular leaf spot caused by Bacterium angulatum

This leaf spot was reported from Virginia and Kentucky in an earlier number of the Plant Disease Bulletin (4 : 52, Aug. 15, 1920). Another report, showing the seriousness of the disease in Kentucky, has been received recently.

Kentucky: Present in all fields of Burley so far examined, causing very extensive injury. Spreading very rapidly because of excessive rains. Loss from wild-fire and angular leaf spot will probably amount to 40% of crop. (Valleau, Sept. 1)

## Root rot caused by Thielavia basicola

Massachusetts: Severe and general earlier in season, but fields have at present outgrown it to a large extent. (C. H. Chapman, Sept. 1).

Maryland: Marlboro, Prince Co. Maryland. Considerable root rot observed in the fields beyond Washington, D. C. (Garner, Sept. 9).

Virginia: Charlotte Court House, Charlotte Co. Stated to have caused considerable loss in several fields scattered throughout Charlotte County. (Wilson, Sept. 9).

Kentucky: Found in about 90% of Burley tobacco fields examined. One severe case of root rot in dark tobacco was seen at Henderson. (Valleau, Sept. 1).

In the White Burley District of Kentucky and Ohio the season seems to have been exceptionally favorable for the development of Thielavia root rot in all sections visited. (C. M. Slagg, Office of Tobacco Investigations, Sept. 9).

Ohio: In Germantown and Miami Valley root rot has been very prevalent this season, being surpassed in severity only by the outbreaks of 1915 and 1918. This disease in conjunction with a late spring made transplanting unusually late for growers whose beds were not sterilized. Up to about the beginning of the second week of August the disease was very noticeable and widespread, especially upon the heavier types of soils and in areas with defective drainage, but the dry weather during the latter half of July and the first few days of August allowed the soil temperature, except on very poorly drained areas, to rise sufficiently for the plants to at least partially recover and throw out new roots with the result that rapid growth followed the timely rains that have fallen since early August, and though rather late, an average crop is indicated on fertile well drained soil. As usual the root rot is much worse on clover sod land than where tobacco follows other crops. Limited observation would indicate corn is one of the best crops to precede tobacco so far as prevention of root rot is concerned. (Houser, Sept. 1).

## Mosaic (cause undetermined)

Massachusetts: Only a small amount as compared with total acreage. A few small and locally heavy infections. Less than usual. (Chapman, Sept. 1).

Ohio: In Germantown and Miami Valley mosaic disease is more prevalent than usual through there having been several worse outbreaks within the last 15 years. In general those growers who have steamed their beds are but little troubled with mosaic this year. The disease, if present at all, being mostly confined to a few spots, while fields set with plants from unsteamed beds are apt to have a large percentage of mosaic over the whole area. Where poultry had access to fields containing diseased plants early in the season, it is a common occurrence to find practically all of the plants diseased in the places where fowls ran over the leaves, thus transferring the disease from plant to plant. Owing to weather conditions the stunting effect and premature blooming and ripening of tobacco affected with mosaic is much more pronounced than usual and for this reason the loss from this disease will be unusually heavy. (Houser, Sept. 1).

Kentucky: Present in most fields in much greater abundance than usual, especially in late plantings from beds picked over one or more times. (Valleau, Sept. 1).

## Other diseases

Rust (cause undetermined) - The so called "rust" disease is reported in Pennsylvania, Kentucky, Tennessee, and Ohio. Mr. Otto Olson of the Office of Tobacco Investigations reports "an alarming outbreak of rust which had started was checked by dry weather, in Lancaster County, Pennsylvania." Mr. True Houser reports the disease from the Miami Valley and the vicinity of Germantown, Ohio, as follows:

> "Considerable in bottom lands where the gravel lies close to the surface, some plants being cut green on account of rust. Whether or not the loss from rust will be important will depend upon the weather during September. Rust seems to attack mosaic plants more readily than others."

Crook neck (so-called) has appeared in several sections of the state of Kentucky. It makes its first appearance closely following severe electrical storms and is considered by many growers to be lightning injury. In one field where lightning struck several times during a storm, injured areas about 40 feet in diameter were found the following day.

Hollow stalk caused by bacterial soft rot - Massachusetts: Occurs occasionally this season particularly on Broadleaf. More than usual. Increase probably due to continued wet weather after topping. (G. H. Chapman, Sept. 1).

Dead spot - A trouble designated as dead spot is reported through the Office of Tobacco Investigations from Chesterfield and Spottsylvania Counties, Virginia, August 11 and 16 respectively.

Yellow French - Ohio (Germantown and Miami Valley): Not abundant. Have observed it only in a few spots where it nearly always appears. (True Houser, Sept. 1).

Rosette disease - Ohio (Germantown and Miami Valley): Rosette disease is more abundant than usual. In other years examination of the roots usually has shown infestation by nematodes and a large proportion having root rot also. Many of the plants with rosette disease are also mosaic. (True Houser, Sept 1)

# FRUITS

## APPLE

### Scab caused by Venturia inaequalis

Scab is bad on unsprayed or poorly sprayed susceptible varieties in the New England, North Atlantic and Ohio Valley states this year. Apparently the disease is considerably less serious in the Appalachian Fruit Belt and Piedmont Plateau than last year, when it was epidemic in those sections. Indications are that about normal amounts are present west of the Mississippi River, except in Oregon and Washington, where it is somewhat more prevalent, especially in the western sections.

Vermont: Occasional only. Around Burlington much worse than last year; rainy

weather in early May and late June seems to be the cause. (Lutman, July 15).

Massachusetts: Very abundant throughout the state on the susceptible varieties. Weather conditions have been favorable. (Krout, Sept. 1)

New Jersey: Widely distributed but in most cases not severe. (Cook, Sept. 1)

Pennsylvania: First reported on May 14 from York County. Prevalent throughout the state. Losses of 5-10% common. Transparent (sprayed trees) showing 5% at State College and promises to be fully as bad as last year. (Thurston, July 1).

Virginia: The commercial crop as a whole is very much better as regards scab infection than last year. Scab is very severe, however, in home orchards and in those which did not receive proper spraying. (Fromme, Sept 1)

West Virginia: Very general throughout the state, causing a large amount of foliage injury and serious fruit injury in some orchards. Well controlled by Bordeaux; fairly well controlled by lime-sulphur; and well controlled by certain dust applications. (Giddings, July 1)

Ohio: Has been very general and severe on both fruit and foliage. Probably most severe epidemic since 1916. The condition for 1919 was that of extreme prevalence upon foliage especially on susceptible varieties in the southern half of the state. The prevailing excessive humidity and sub-normal temperature during the season of 1920 has led to fullest growth of the fungus. Good fruit conditions are generally reported where a pre-blossom spray of Bordeaux mixture was applied; favorable report is made in one or more cases from pre-blossom spray of lime-sulphur. The early or pre-pink application of Bordeaux mixture gave excellent results in Gallia County. In many cases north of the central region the delayed dormant spray, successful in 1919, made a failure in scab control for 1920. (Selby, Sept. 1)

Indiana: Extremely severe in Indiana this season. (Gardner, July 1)

Illinois: Scab was very serious throughout the central and western apple growing regions of the state. The foliage suffered severely owing to application of sprays following early infection. A long period of cold, damp weather during the cluster bud stage favored fruit infection. Failure to apply the cluster bud spray resulted in almost total loss of crop in many cases. 5-10% loss this year is conservative. (Anderson, Sept. 1)

Minnesota: Generally distributed throughout the state. Severe local epidemics are common. Some orchards are very heavily infected. First report June 20. (Leach, Sept. 1)

Arkansas: Severe on unsprayed fruit. Well controlled in well kept orchards. (Elliott, Sept. 1)

Oregon: Serious in western Oregon, especially in the Willamette Valley, where many young orchards are just coming into bearing and the growers have not yet learned the habit of timely and thorough spraying. In many commercial orchards 50% of the crop will be culls. (Barss, Sept. 1)

Washington: On July 27, Mr. Frank reported a "small amount of scab" on the West Side. "Not serious yet." In eastern Washington we have more scab than during the last four years. Late infections were showing on leaves and on fruit August 1 and September 1 respectively. (Heald and Dana, Aug. 1)

Fire blight caused by Bacillus amylovorus

Taking the country as a whole it may be said that fire blight of apples is decidedly more prevalent this year. Reports from the following states are at hand. (See also reports in Plant Disease Bulletin 4: 13-14, 1920)

Vermont: Very common. Most trees that have set any quantity of fruit show much fire-blight around Burlington. Rainy weather during early May and during the blossoming season of the early apples may have been responsible. (Lutman, July 15)

Massachusetts: Very abundant in most sections of the state. (Krout, Sept. 1)

New Jersey: Widely distributed but not severe. (Cook, Sept. 1)

Pennsylvania: First report May 17 on Stayman and York in Adams County. Early infection did not look bad. For the past two weeks, however, blight is taking hold and the customary twig blight and blossom blight seems to be working farther down the branches than usual. (Thurston, July 1)

Virginia: Very slight for the commercial orchard section as a whole. (Fromme, Sept. 1)

West Virginia: Not prevalent and has caused very little loss this season. (Giddings, July 1)

Ohio: Has developed locally in variable virulence but in all cases was reported after blooming, starting upon new growth. The prevalence is more marked and general than in 1919. (Selby, Sept. 1)

Indiana: Worse than usual this year. Usually destructive only where blighted pear trees are nearby. (Gardner, July 1)

Illinois: Very little early in season. Appeared on fruit when about the size of marbles. Not serious in any part of the state. (Anderson, Sept. 1)

Wisconsin: After sending in my July 1 report on apple fire blight, the disease commenced to show up in Madison and reports of it have come from every section of the state. It seems that there is more twig blight than for a number of years. (Vaughan, July 28)

Minnesota: General throughout the state and very severe, probably the worst epidemic in several years. (Leach, Sept. 1)

Nebraska: Present in usual amounts. (Goss, Sept. 1)

Mississippi: Twig blight is serious in many of the northern counties of the state. This is probably one of the more serious apple troubles. (Neal, Sept. 1)

Arkansas: Some damage to Jonathans early in the year. (Elliott, Sept. 1)

Texas: Epidemic, 10% loss. (Taubenhaus, July 15)

New Mexico: Very slight. (Leonian, July 1)

Nevada: Has been quite prevalent this season over the state. (Lantz, Sept. 1)

Idaho: A number of orchards of Spitzenburg apples have been dug up on account of blight infection. Not as much blight as last year in most sections. (Hungerford, July 1)

Oregon: Serious in Rogue River Valley; some in the Umpqua Valley but total damage slight; Willamette Valley negligible; no reports from sections east of the Cascades but disease doubtless present. (Barss, Sept. 1)

Washington: Reports from Clarkston, White Salmon, Yakima Valley and Upper Columbia, but not severe in any of these localities. (Heald and Dana, Aug. 1)

## Blotch caused by Phyllosticta solitaria

In the regions where blotch occurs heavy infections have taken place this year on trees of susceptible sorts that were not properly sprayed.

Pennsylvania: Reported on twigs in Wyoming County, March 17. One hundred per cent on Smith Cider, Lackawanna County, July 17. Other reports from Schuylkill, Carbon and Blair Counties indicate especial severity on the above variety. (Thurston, July 1).

Virginia: Very severe locally but not of importance for the commercial crop of the state as a whole. One hundred per cent infection seen on unsprayed Ben Davis trees at Crozet. (Fromme, Sept. 1)

Kentucky: Very severe in unsprayed orchards; prevalent in all parts of the state. (Valleau, Sept. 1)

Ohio: It is believed that more than the average per cent of blotch has developed on orchards that have not received spray treatment for that disease. (A. D. Selby, Sept. 1)

Illinois: Very bad on early susceptible varieties such as Duchess and Benoni. Where orchards were well sprayed early in the season the fruit was in fair condition. Failure to apply blotch spray early resulted in very poor control; 5-10% loss on susceptible varieties. (Anderson, Sept. 1)

Alabama: Blotch was very serious in Alabama this year, the loss in some orchards being as high as 25%. Where spraying was carried on the disease was checked but not controlled entirely. (Thiel, Sept. 1)

Mississippi: Observed in Oktibbeha, Pontotoc, and Union Counties. Not serious in well sprayed orchards. (Neal, Sept. 1)

Texas: Epidemic -3% loss. (Taubenhaus, July 15)

Arkansas: Very severe on fruit not properly sprayed. (Elliott, Sept. 1)

## Cedar rust caused by Gymnosporangium juniperi-virginianae

In the Shenandoah Valley of Virginia and in northeastern West Virginia cedar rust is abundant and the cause of heavy losses to York Imperials and other susceptible varieties when in the vicinity of red cedar trees. Many illustrations are at hand showing that the disease can be eliminated by red cedar eradication. Reports from Virginia, Tennessee and Illinois have already been given (Pl. Dis. Bul. 4 : 15, 1920). In the following states the disease is not of great commercial importance.

Indiana: Prevalent on susceptible varieties. (Gardner, July 1, 1920)

Minnesota: Not very prevalent. A few isolated infections have been reported. First report July 2. (Leach, Sept. 1)

Alabama: Present in the state. No data on damage.

Arkansas: Extremely severe in regions where cedars are plentiful. Trees (Jonathans) defoliated in July and August. Cedar trees nearly all cut in the better commercial orchard districts. (Elliott, Sept. 1)

Bitter rot caused by Glomerella cingulata

New Jersey: Bitter rot common. (Cook, Sept. 1)
Virginia: Not as severe as last year and possibly less than normal. Slight infection appeared at the usual time in mid July but development and spread has not been rapid. (Fromme, Sept. 1)
Illinois: No reports of bitter rot to date. Weather has been unfavorable, since August was cool and dry in most sections of the state. Rainy periods were followed by cold weather. (Anderson, Sept. 1)

Black rot caused by Physalospora cydoniae

Massachusetts: Very abundant on leaves and limbs in most unsprayed orchards, some trees being almost defoliated by it. (Krout, Sept. 1)
Indiana: Very prevalent on the foliage. (Gardner, July 1)
Alabama: Present in the state. No data on damage. (Thiel, Sept. 1)

Black rot caused by Sphaeropsis malorum

Pennsylvania: First report of frog-eye leaf spot from State College July 10 - slight. Reported 4% in Bradford County with average of eleven orchards. (Thurston, July 1)

Anthracnose caused by Neofabraea malicorticis

Washington: About the same as in former years from White Salmon sections and from west of the Cascades. (Heald and Dana, Aug. 1)

Rosette (non-parasitic)

Idaho: About the usual amount of damage from rosette. Very clear evidence of the influence of cultural and soil condition upon the disease noted in a number of orchards. In one orchard of young trees, all of the same variety, part of the orchard had been continuously cropped to alfalfa for ten years and no rosette was present. The rest of the orchard had been clean cultivated and cropped to wheat and garden truck. Every tree was rosetted in this area. (Hungerford, July 1)

Sun scorch (non-parasitic)

Virginia: Specimens have been received from a number of growers of leaves that show a scorched condition, evidently due to hot sun following a period of excessive rainfall. Complaints began to come in about the middle of August. The rainfall has been unusually heavy during the entire month. (Fromme, Sept. 1)